

Q & A

Distributed Energy Road Show

Anchorage, AK
December 11, 2003

Distributed Energy: National Perspective

- Q: Why does the slide (slide 2) say “operates at a minimum level of reliability” instead of maximum?
- A: It is not an optimum requirement, but a minimum requirement of 99.9% reliability or no less than 8 hours per year. That minimum level was determined before taking into account the ‘digital era.’
- Q: Do EPA regulations hinder plants from making upgrades?
- A: Not if utilities are allowed by their state regulators to roll the cost of those upgrades into their rate base.
- Q: Do customers have to be involved with more levels of regulation because of grid interconnection?
- A: Yes, somewhat. Grid parallel systems are more complicated than grid-independent systems, and the installation/operation procedures require the local utility to participate in the permitting process.
- Q: Does a fuel cell have a UL listing?
- A: ANSI standard Z21.83 is available for testing to, and that has become a CSA standard. UL does not yet have an electrical safety standard for fuel cells.

DG in Alaska

- Q: Have you sold and installed any solar systems?
- A: Yes, about 15 for seasonal use, mostly to the telecommunications industry.
- Q: What is the cost of energy produced off a propane generator?
- A: Similar or more attractive than a diesel generator.
- Q: Is propane mostly used for remote places?
- A: Yes, natural gas is more often used in the city.
- Q: Have you looked into new flywheel technologies for peak shaving?
- A: We have looked into it with great interest but financial and technical issues have hindered their wide commercialization.

Comment: About 200 small villages in Alaska have DG or island systems with heat recovery. That is considered to be “DG” at the national level.

Comment: At the national level, DG is not defined by size but by whether or not it taps into the transmission (above 64 kVa), or distribution system. No matter the size, if it taps in at the distribution feeder-level, we consider it to be “distributed.”

Emissions Permitting in Alaska

- Q: Can you give us a sense of what size system you can install before you need a construction permit?
- A: Diesel, about 5 MW; gas, up to 50 MW. If you have an existing facility that has a permit, you may still need to get an update or apply for a different type of permitting.

Comment: The criteria for threshold depends on what would be possible if the unit were to run 24/7 for an entire year.

- Q: Is any part of Alaska not in compliance with National Ambient Air Quality Standards?
- A: Yes, some due to traffic and some due to dust particles carried by the wind.
- Q: What about the Red Dog site?
- A: I permitted Red Dog. The permitting process is currently held up in a lawsuit between the EPA and the state of Alaska in the U.S. Supreme Court. A decision is expected in March.

Hydrogen Safety

- Q: Since there are so many problems with transporting pure hydrogen, where are you planning to reform it?
- A: That's the 64-million-dollar question. Some sort of disbursed or distributed network of hydrogen production facilities is probably where we're headed. In other words, hydrogen is produced in smaller quantities at gas stations, or government or utility facilities, or at the home.
- Q: What are hydrogen blends actually comprised of?
- A: Natural gas and hydrogen
- Q: If a fuel cell freezes, is it operational again once it thaws?
- A: No, generally the expansion of the frozen water will break it.

Microturbines

- Q: Have you had a situation in which DG on a parallel circuit caused a fault current or a power failure?
- A: Not in which the parallel circuit was completely responsible, but I have experienced DG contributing to fault current.
- Q: How do you provide protection for linemen?
- A: Codes and standards (NESC, or National Electrical Safety Code) are designed to do that. We have computerized sensors and monitoring operations.
- Q: Do all commercially available systems include adequate safety devices?
- A: Capstone does and is working on the development of IEEE guidelines.
- Q: Have you worked with other organizations on these (IEEE) guidelines?
- A: Yes: the Association of Electrical Engineers, several architecture association, etc.

Comment: IEEE P1547 provides for the electrical interconnection of distributed energy systems on electrical distribution systems. UL 1741 covers inverters and power converters.

Q: Where is the line of demarcation?

A: It is the dotted line on Slide 8.

Wind

Q: What is Chugach doing about wind energy?

A: We hired a meteorologist in 1998 to locate prime areas/sites. We are still exploring possibilities, particularly Fire Island.

Q: Is your wind info public?

A: No.

Q: What response have you gotten from the public?

A: Early surveys showed overwhelming interest in a 'green pricing program.'

Q: Is wind energy economically viable?

A: It depends on the size of the project. Fire Island is large enough to be competitive.

Q: What are the visuals for the proposed towers?

A: In order to protect birds, we are proposing tubular towers which discourage nesting, as well as, slower turning blades. They are less noisy than earlier models but huge turbines still have aesthetic issues.

Comment: Built out, Fire Island could reach 120 MW.

Q: Is it a problem with the FAA?

A: No, construction would be below glide lines.

Q: What about interference with navigational radios?

A: We're looking at EMF interference, but we haven't yet determined that it will be a problem.

Q: You said that costs are competitive, what does that include?

A: Both operation and maintenance.

Comment: Wind maintenance has really improved. Costs have dropped about 85% in the last decade.

Q: Is the life cycle completely over at 25 years?

A: No, only blades and generators will need to be replaced. Cost of recap is significantly less than start-up costs.

Fuel Cells

Q: Is the nickel unit more durable than the PEM Fuel Cell?

A: No.

Q: What are the emission benefits?

A: The primary concern is the reformer. As long as it does not leak CO₂, emissions are manageable.

Q: Is the source of oxygen for the fuel cells O₂ or ambient air?

A: Ambient air.

Focus questions

What is your reaction to the potential role of distributed energy in your community?

- Is it possible to use hybrid technologies as a stepping stone?
- A: Yes, and that is a very likely scenario in my opinion.
- Why was there so little discussion on batteries? Electric storage is much further away.
- This information isn't new. It all boils down to economics. Interest spurs when there are threats to our power system.
- DG is already in use, just not universally.
- Flywheels are the future of energy storage. However, there are still great safety issues.
- What about capacitor theory? (Using the earth to store lightening.) (no discussion).
- Is a world "macro grid" possible? Not really.

A: The closest thing is perhaps the system in North Africa and the Mediterranean.
(Discussed article about Japanese nuclear plants < 200 kW for high-rise bldgs.)

- DG is beneficial for Alaska, it decentralizes reliability.
- Is Europe ahead of us?

A: Yes.

If I carry one message back to DC, what would it be?

- Concerning public policy, there needs to be industry incentive to explore alternative fuel sources. We need to create a market to encourage investment.
- Keep in mind, Alaska is an oil state. Those in power may be reluctant to embrace new technologies.
- Alaskans would like ANWR open for drilling.

What additional products and services can we provide to help you streamline DE installation and encourage more widespread use in your area?

- Adopt codes and standards
- Send CD with new technical information.